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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/706,060	11/03/2000	Norman C. Brackett	55,112 (1850)	6659

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EXAMINER

STEFANON, JUSTIN

ART UNIT PAPER NUMBER

3682

DATE MAILED: 07/01/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/706,060

Applicant(s)

BRACKETT, NORMAN C.

Examiner

Justin Stefanon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 June 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 13 June, 2002 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 2-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 recites the limitation "the design operating speed" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 2,3,5-7, and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by US Pat. No. 4,860,611 to Flanagan.

Flanagan discloses a stiff metallic hub 3 for an energy storage device having a flywheel assembly with a central core in tight interference fit with a rotary shaft 4, an outer rim section in tight interference fit with a composite fiber rim 7 and a web section, comprising four spokes, integrally formed to the central core and the outer rim section. During a start-up operation, a flywheel must accelerate from zero, therefore any flywheel inherently has a design operating speed below all of its critical velocities. The flywheel of Flanagan is aluminum. Since the flywheel achieves a speed above a critical velocity, it inherently will pass through a design operating speed one third of that critical velocity. At high operating speeds the rim section is capable of deforming in a radial direction to maintain a tight interference fit with the composite rim. The rim achieves a speed of 29,000 rpm, therefore a design operating speed of the flywheel assembly is about 22,500 rpm. The outer rim includes a balancing rail, the inner wall of the rim, for balancing the flywheel, as described in Column 4, lines 20-22.

5. Claims 2,4, and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by US Pat. No. 5,816,114 to Gregoire et al.

Gregoire discloses a stiff hub 22, which may be metallic as disclosed in Column 4, lines 38-39, for an energy storage device having a flywheel assembly with a central core 26 in tight interference fit with a rotary shaft 12, an outer rim section 32 in tight interference fit with a composite fiber rim 36 and a web section 28 integrally formed to the central core and the outer rim section. During a start-up operation, a flywheel must

accelerate from zero, therefore any flywheel inherently has a design operating speed below all of its critical velocities. The web section is circumferentially continuous as seen in Figure 1. At high operating speeds the rim section is capable of deforming in a radial direction to maintain a tight interference fit with the composite rim. The rim achieves a speed of 101,000 rpm, therefore a design operating speed of the flywheel assembly is about 22,500 rpm.

6. Claims 2-4,6,7 are rejected under 35 U.S.C. 102(b) as being anticipated by US Pat No. 5,628,232 to Bakholdin et al.

Bakholdin discloses a stiff aluminum hub 100 for an energy storage device having a flywheel assembly with a central core 15 in tight interference fit with a rotary shaft 3, an outer rim section 14 in tight interference fit with a composite fiber rim 9 and a web section 13 integrally formed to the central core and the outer rim section. The mechanical resonance frequency, or critical velocity, of the hub is above the maximum operating speed of the hub. The web is circumferentially continuous, as seen in Figure 6A. The outer rim section is capable of deforming commensurate with the carbon rim in a radial direction, as both deform as a function of radial speed, and a tight interference fit is maintained via spring 20. The rim achieves a speed of 8,000 radians per second, therefore a design operating speed of the flywheel assembly is about 22,500 rpm.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 5,8,9, and 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bakholdin et al.

In reference to claim 5, Bakholdin discloses a hub with a critical velocity greater than a design operating speed of the flywheel assembly. While the reference is silent as to the exact ratio of the critical velocity to the operating speeds, it would have been obvious to one skilled in the art at the time the invention was made to make the critical speed at least 40% higher than the operating speeds, in order to avoid increased excitation of the system as it approaches a resonant frequency, yet not more than 200% higher as it would then be unnecessarily stiff and result in an overly heavy piece.

In reference to claims 8,9, and 11, the dimensions given in the claims depend upon the overall dimensions of the flywheel system as a whole. By changing the dimensions of the flywheel of Bakholdin, an engineer would modify the dimensions of the central core, the outer rim section, and the web section accordingly. It would have been obvious to one skilled in the art at the time the invention was made to change the size of the flywheel and hub of Bakholdin to fit in a smaller space, or to store more energy. The rotary shaft 3 is supported by magnetic bearings 6 and 7.

9. Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gregoire et al.

The dimensions given in the claims depend upon the overall dimensions of the flywheel system as a whole. By changing the dimensions of the flywheel of Gregoire, an engineer would modify the dimensions of the central core, the outer rim section, and

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the web section accordingly. It would have been obvious to one skilled in the art at the time the invention was made to change the size of the flywheel and hub of Gregoire to fit in a smaller space, or to store more energy. The rotary shaft 12 is supported by mechanical bearings 14.

10. Claims 2,3,4 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,634,381 to Thoolen in view of US Patent No. 5,012,694 to McGrath.

Thoolen discloses a stiff hub 6 for an energy storage device having a flywheel assembly with a central core 26 in tight interference fit with a rotary shaft 2, an outer rim section 10 in tight interference fit with a composite fiber rim 4 and a circumferentially continuous web section 14 integrally formed to the central core and the outer rim section. During a start-up operation, a flywheel must accelerate from zero, therefore any flywheel inherently has a design operating speed below all of its critical velocities. Thoolen is silent on the material used for the hub, but states that the arrangement is similar to that of McGrath. McGrath discloses a stiff metallic hub 22 comprised of steel or aluminum. It would have been obvious to one of skill in the art at the time the invention was made to construct the hub of Thoolen of steel or aluminum as shown by McGrath, since Thoolen states similar construction to McGrath. Thoolen discloses an axial stop, which interfaces with part 20, and prevents the composite rim 4 from falling off the outer rim 10 during high-speed operation.

Response to Amendment

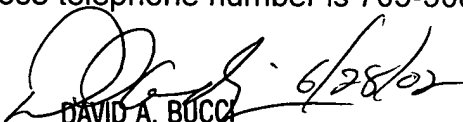
11. Applicant's arguments with respect to claims 2-13 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin Stefanon whose telephone number is 703-305-1945. The examiner can normally be reached on Monday - Friday 6 - 3:30, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David A. Bucci can be reached on 703-308-3668. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-7687 for regular communications and 703-305-7687 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1113.


DAVID A. BUCCI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3600

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June 27, 2002